KAUSHAL JAGANNATH BACHHAV

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EDUCATION

INDIAN INSTITUTE OF TECHNOLOGY, MADRAS | **JAN 2022 - JANUARY 2025**
MS(Research) in mechanical Engineering | **CGPA: 8.5/10**
JSPMS RAJARSHI SHAHU COLLEGE OF ENGINEERING, PUNE | **AUGUST 2015 - AUGUST 2019**
BE in mechanical Engineering | **CGPA: 9.03/10**

PROJECTS

Algorithm development for defect detection using phased array Ultrasonics
- Developed imaging algorithm using TFM method for defect detection and visualization, Improved probability of defect detection by implementing phase coherence Approach, Improved **Signal to noise ratio by 1463%** compared to existing TFM methods.
- Improved **Imaging resolution by 4 times** and defect detection **sensitivity by 8 times** compared to existing limits.
- Developed algorithm to automate FEA simulation process, to performs time efficient wave propagation FEA Analysis

Algorithm development for Defect Detection classification using Deep Learning
- Developed and Trained RCNN and MLP models for the classification of different types of weld defects from TFM-based images
- Worked on increasing the weld defect dataset-generating capabilities using DCGAN for model Training.
- Achieved a **mAP value of 85%** for the ADR model. The model's classification performance on the hybrid dataset resulted in an **F1-score of 0.86** for porosity detection and **0.80** for slag detection.

Bearing Fault Detection Using Machine Learning
- Implemented Random Forest and XGBoost for fault detection from vibration data, achieving **97% accuracy** with XGBoost.
- Optimized model performance using grid search and cross-validation.
- Utilized Python with TensorFlow, Scikit-Learn, and XGBoost for development and analysis

TECHNICAL SKILLS

- **Programming Language:** Python, MATLAB
- **Tools:** NumPy, Matplotlib, Pandas, seaborn.
- **Libraries:** Scikit-learn, Seaborn, TensorFlow, Keras

CERTIFICATIONS

- **Machine Learning Specialization** offered by Stanford online through Coursera.
- **Deep Learning** Specialization offered by PadhAI (Prof Mitesh khapra IIT Madras).
- **Python** Beginner to Advance offered by GFG.
- **Introduction to statistics** offered by Stanford online through Coursera.

ACHIEVEMENTS

- Recipient of the prestigious IITM PRAVARTAK **Postgraduate Fellowship** awarded by the IITM PRAVARTAK Foundation.
- Secured **98.10 percentile** in GATE Mechanical Engineering 2021 exam out of a pool of 120594 candidates.
- Secured **97.97 percentile** in GATE Engineering Sciences (XE) 2021 exam out of a pool of 22219 candidates

CONFERENCE AND PUBLICATIONS

- **Guided Wave Phased Array Ultrasonic Imaging for Thin Plate Inspection**, e-Journal of Nondestructive Testing, July 2024.
- **Phased Array Ultrasonic Imaging for Characterizing Steel with an Elevated Temperature Gradient**, e-Journal of Nondestructive Testing (eJNDT), July 2024
- **EWSHM 2024, Potsdam, Germany**

  Delivered a presentation on the research findings of Guided Wave Phased Array Ultrasonic Imaging for Thin Plate Inspection at the 11TH European Workshop on Structural Health Monitoring (EWSHM 2024), Potsdam, Germany
- **NDE 2024, Chennai, India.**

  Delivered a poster presentation on the research findings of Guided Wave Phased Array Imaging for Thin Plate Inspection Using Full Matrix Capture and Virtual Array Source Aperture at the Conference and Exhibition on Non-Destructive Testing & Enabling Technologies (NDE 2024), Chennai, India
- **NDE 2023, Pune, India.**

  Delivered a poster presentation on the abstract titled Guided Wave Phased Array Imaging at the 33rd Annual Conference & Exhibition on Non-Destructive Evaluation (NDE 2023), Pune, India

POSITIONS OF RESPONSIBILITY

- **Graduate Teaching Assistant, IIT Madras:** Graduate TA for Machine Design Lab (Jan-May 2023), Design of Machine Element (Jul-Nov 2023) and Mechanical Engineering Lab-I (Jan-May 2024) at Mechanical Eng Department IITM.
- **Research Assistant, IIT Madras:** Half-time research assistant at the Centre of Non-Destructive Evaluation Lab at IITM and post graduate fellow at IITM
- **Coordinator AIRSS 2024, IIT Madras:** Served as a coordinator for the All-India Research Scholars Summit (AIRSS) -2024, IITM

SOCIAL SKILLS AND ACTIVITIES

- **Languages:** English, Hindi, Marathi.
- **Hobbies:** Gym, Travelling, Running